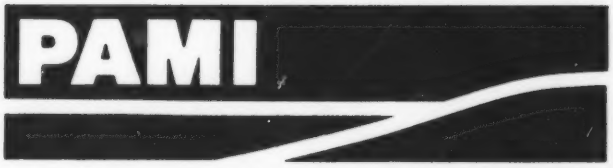
Twelfth
Annual Report
1985-1986

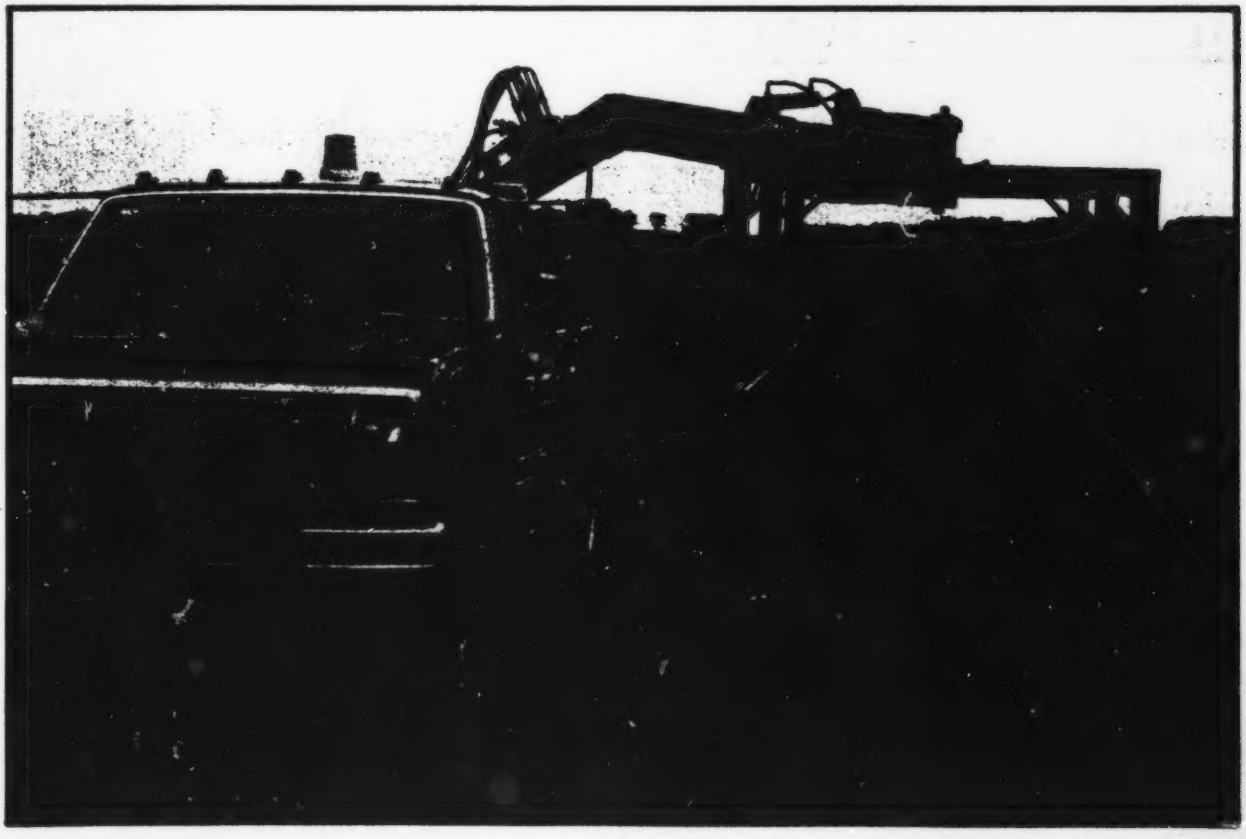


PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

THE PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

"to improve the design and aid in the selection and use of agricultural machinery in the prairie provinces"

To achieve this goal, the provinces of Alberta, Manitoba and Saskatchewan established the Prairie Agricultural Machinery Institute as a unique resource to the farmers and agricultural machinery manufacturers of the prairies. Since its inception October 10, 1974, programs to provide for the evaluation and development of agricultural machines, for research into matters concerning agricultural machines and for the extension of information on agricultural machines have been the primary concern of the Machinery Institute.



PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

LETTER OF TRANSMITTAL

Regina, Saskatchewan
March 1986

His Honour F.W. Johnson, Q.C.
Lieutenant Governor
Province of Saskatchewan

May It Please Your Honour:

Pursuant to Section 19(1) and (2) of the Prairie Agricultural Machinery Institute Act, R.R.S. 1978. I respectfully submit, for your consideration, the Annual report of the Prairie Agricultural Machinery Institute for the fiscal year ending March 31, 1986.

Your obedient servant,

Grant Devine
Premier and Minister of Agriculture
Province of Saskatchewan

LETTER OF TRANSMITTAL

Humboldt, Saskatchewan
March 1986

Honourable Grant Devine
Premier and Minister of Agriculture
Province of Saskatchewan

Honourable Peter Elzinga
Minister of Agriculture
Province of Alberta

Honourable Bill Uruski
Minister of Agriculture
Province of Manitoba

Sirs:

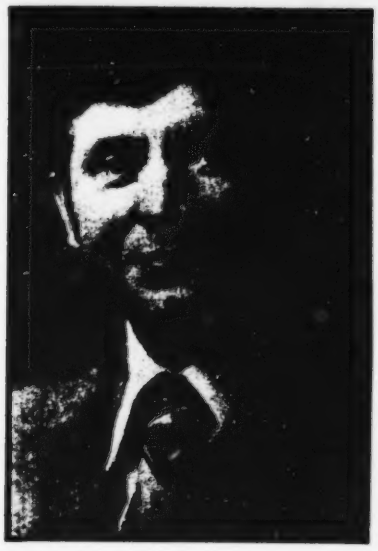
It is my honour to present the Annual Report and audited financial statements of the Prairie Agricultural Machinery Institute for the fiscal year ending March 31, 1986.

Respectfully submitted,

G. Nystuen, Chairman
Prairie Agricultural
Machinery Institute Council

Honourable
Grant Devine
Premier and Minister
of Agriculture
Province of Saskatchewan

Honourable
Peter Elzinga
Minister of Agriculture
Province of Alberta



Honourable
Bill Uruski
Minister of Agriculture
Province of Manitoba

MEMBERS OF COUNCIL

Name

CHAIRMAN
G. Nystuen
Spalding, Saskatchewan

COUNCILLORS
D. Green
Claresholm, Alberta

J. Enns
Oak Bluff, Manitoba

R.S. Forrest
Alberta Agriculture
Edmonton, Alberta

W.B. Reed
University of Saskatchewan
Saskatoon, Saskatchewan

T.L. Pringle
Manitoba Dept. of Agriculture
Winnipeg, Manitoba

L.R. Warden
CASE-IH
Regina, Saskatchewan

A. Burghardt
Versatile Noble Cultivators Co.
Nobleford, Alberta

J. Huber
Raymore, Saskatchewan

B. Nicholson
Shoal Lake, Manitoba

M. Westby
Watrous, Saskatchewan

SECRETARY
L.G. Smith, Director
Prairie Agricultural Machinery Institute
Humboldt, Saskatchewan

Humboldt, Saskatchewan
March, 1986

Mr. G. Nystuen, Chairman
Prairie Agricultural Machinery
Institute
Spalding, Saskatchewan

Dear Sir:

It is my honour to submit the Twelfth Annual report of the Prairie Agricultural Machinery Institute for the year ending March 31, 1986.

Manufacturers of farm machinery have continued to utilize the services of the Institute at a higher level than has been experienced in the past several years, in spite of the down turn in the agricultural economy. During the year, 39 projects were completed for a total contract revenue in excess of $230,000.

In addition, over sixty pieces of equipment were assessed in the evaluation program. At the request of several producers, an increased emphasis has been placed on the evaluation of hay harvesting equipment and with input from farmer surveys, we have priorized our evaluation program to provide information on high priority equipment.

We would again like to express our appreciation to the Governments, Council and the farming industry for their support this past year and to our staff for their continued dedication to providing excellent service.

Respectfully submitted,

Lorne G. Smith,
Director

PROGRAMS AND OBJECTIVES

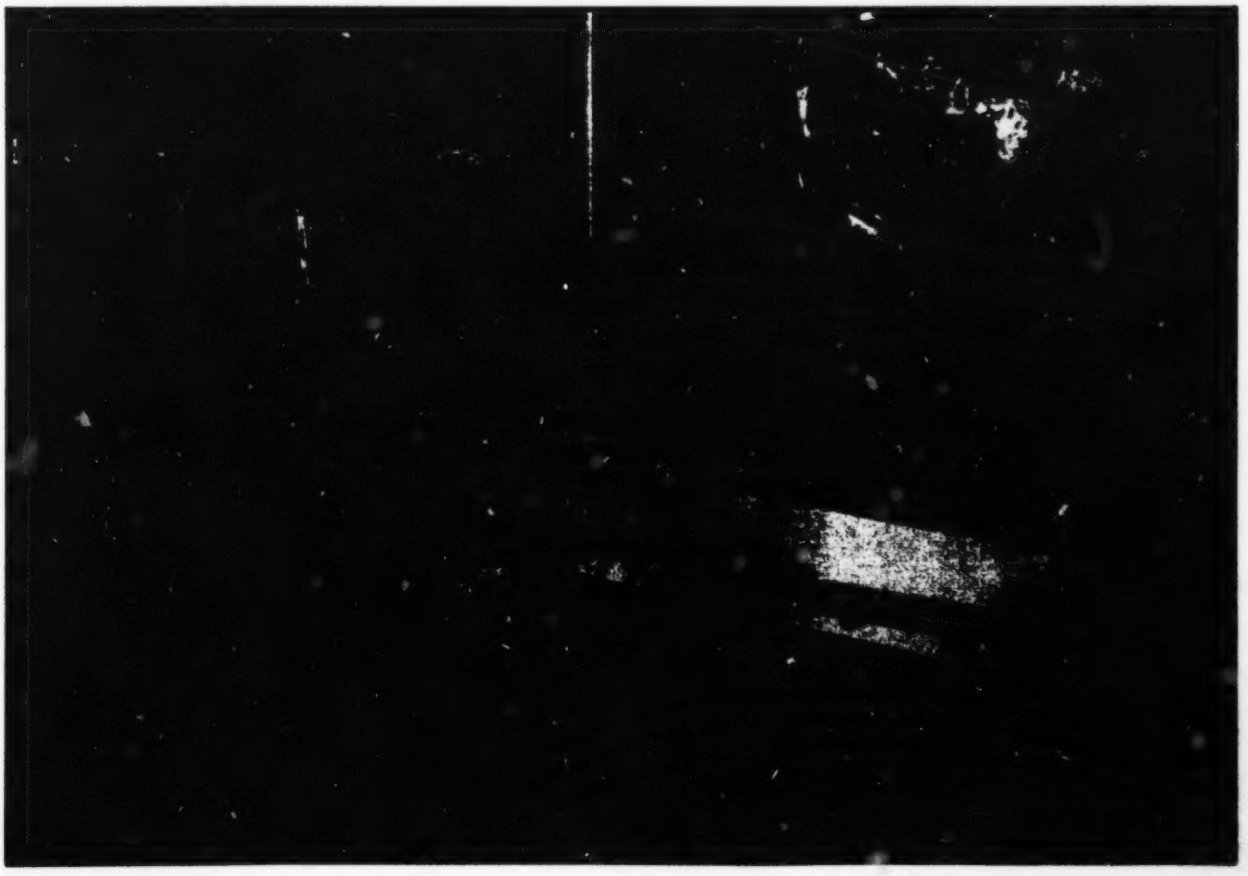
The general terms of reference for the Institute are provided in The Prairie Agricultural Machinery Institute Act which was passed by the Saskatchewan Legislature in 1974. Under this act, an agreement between the Ministers of Agriculture for Saskatchewan, Alberta and Manitoba provides for the Institute to be supported and operated as a co-operative venture of these provinces. The Prairie Agricultural Machinery Institute Council has the power to define programs and guide the activities of the Institute, within the terms of the act.

The purpose of the Institute is "to improve the design and aid in the selection and use of agricultural machinery in the prairie provinces." Three stations are located at Humboldt, Saskatchewan; Lethbridge, Alberta; and Portage la Prairie, Manitoba. Each carries out programs of special interest to farmers and manufacturers in its province.

PROGRAMS

Four distinct programs are defined and carried out by the Institute, as follows:

1. Development Program - aimed at assisting industry in developing and improving machines for prairie agriculture.
2. Evaluation Program - aimed at evaluating the performance of agricultural machinery in prairie conditions.
3. Research Program - aimed at ensuring that priority research projects, relative to agricultural machinery, are carried out to suit changing agricultural practices and economic conditions.
4. Extension Program - aimed at providing farmer with information to assist in the intelligent purchase, and safe and efficient operation of agricultural machinery.



DEVELOPMENT PROGRAM

Under this program, assistance is provided to manufacturers in developing and improving machines to suit prairie needs. This may take the form of prototype or preproduction testing, design modifications, or assistance in developing new machine concepts.

Some of the services available to manufacturers include the use of mobile field laboratories and specialized measuring equipment, durability testing of components or complete machine assemblies, experimental stress analysis, design of electronic control systems, standards compliance testing, sound level measurement, high speed photography, technical information searches and finite element analysis.

Every effort is made to assist prairie manufacturers who request immediate help to remedy urgent problems. Fee for service arrangements for development work are negotiated between the manufacturer and the Institute. A confidential report is provided to the manufacturers at the conclusion of each project.

EVALUATION PROGRAM

The Institute carries out functional evaluation of agricultural machines to determine performance characteristics, workrates, power requirements, safety aspects and general suitability for prairie agriculture.

Priorities for selection of test machines are based on the availability of performance data, the uniqueness of the machine for prairie agriculture and the frequency of information requests.

Field work is performed in selected locations throughout the prairie provinces. Results of evaluation work carried out by the Institute are made available to the public.

RESEARCH PROGRAM

The Institute conducts selected timely research projects on machinery related subjects, usually in co-operation with universities, research institutions, test agencies and interested manufacturers. These projects are aimed at determining design parameters, assessing new machinery for modifying cultural practices, developing mechanization to suit new crops, developing evaluation procedures and developing safety performance standards.

EXTENSION PROGRAM

Extension involves the dissemination of information obtained through other programs, to farmers, manufacturers, extension agencies and other interested groups and individuals.

The main extension vehicles are evaluation reports and "Gleanings" published and distributed to the public by the Institute. "Machinery Institute News" is circulated to extension agencies and others, to keep them informed on PAMI activities. Staff are also involved in short courses, meetings, tours, radio and television interviews, news releases, trade fairs and have membership on many external committees.

The extension program also involves preparation of movie and slide presentations on programs and individual projects for use by Institute and other extension agency personnel. Exhibits are also prepared for use at various functions.

Selected extension projects involving assembly and publication of information from various sources, are carried out as indicated by extension activities and information requests.

PROGRESS DURING 1985-86

ACTIVITIES AT THE HUMBOLDT STATION

- G.E. Frehlich, Station Manager

EVALUATION PROGRAM

Evaluation reports were completed on one combine, two windrowers, two cultivators, one oscillating harrow, and one crop divider. In addition, an interim report was released on a combine that was tested in the fall of 1985. Because of problems encountered during the tests, modifications were made to the combine which delayed the evaluation and the final report.

In addition to the above, evaluation reports on three fertilizer attachments and seven hopper bin natural air drying systems were being written. These reports are scheduled to be mailed to the subscribers in June.

Several machines have been finalized for testing during the 1986-87 Fiscal Year. These include two combines, an airfoil chaffer for combines, two new cultivators, and two windrowers. Other machines are being considered for testing for fall and winter. All the reports will be completed and mailed out to the subscribers next year before their season of use.

DEVELOPMENT PROGRAM

In 1985-86, the Humboldt Station completed nineteen development projects for a total revenue of $115,000.00. Altogether throughout the year, twenty seven projects were initiated for twenty three different manufacturers. In addition, fifteen other manufacturers received technical advice from the Humboldt engineers on the development of new products.

The development projects completed during the year included calibration of grain drills for coated rapeseed, measurement of cultivator wheel loads, testing of combine modifications, testing of a prototype heat exchanger for grain drying, measurement of irrigation pump power requirements, testing of twine strength for two different manufacturers, measurement of power and high speed filming of a snow blower, and durability testing of cultivator shank mechanisms for three different manufacturers. They also included prototype testing of straw spreaders for two different manufacturers, testing of a new machine for improving the feed value of round bales, durability testing of a cultivator tilt controller, and calibration and distribution uniformity testing of a fertilizer attachment.

Each year, more manufacturers take advantage of PAMI's development program. They find the expertise and experience that PAMI staff have obtained throughout the years to be very valuable in developing and testing their prototype machines.

EXTENSION PROGRAM

Over the past year, the Institute's staff in Humboldt have been in direct contact with over 12,000 farmers. Thirty-three clinics on planting equipment, combines, and grain drying were conducted throughout the province. One clinic on combine operation and adjustment was attended by more than 300 farmers. In addition to the clinics, the Institute was represented at the Mexabition in Saskatoon, the Mexabition-Agribition and Western Canada Farm Progress Show in Regina, and the Agri-Mex in North Battleford. Three new promotional displays along with promotional material were prepared and used in these shows and clinics.

Twenty-three newspaper articles were sent out to the media. Eight TV interviews and 24 radio interviews were conducted. A video production on seeding and fertilizing equipment was produced and made available to the public, agricultural extension people, and the media.

Throughout the year, PAMI staff were present as guest speakers at ratepayer meetings and technical conferences throughout the province. Altogether, they attended 27 different events. In addition, PAMI staff continued to maintain their presence in the technical societies. An ASAE paper on "The Effects of Reducing MOG/G on Combine Performance" was presented at the winter ASAE meeting in Chicago.

Humboldt staff also conducted over 60 tours for farm, education, government, and professional groups from Saskatchewan, Manitoba, Alberta, and as far away as Germany, Japan, Australia, Ethiopia, Tanzania, and China. The tours are very popular and very useful in showing the public what we do.

PAMI staff are always ready to answer questions and to respond to requests from the public. During the wet fall of 1985, two of Humboldt's engineers were kept busy for three full months responding to questions from farmers on grain drying equipment and procedures. In addition, questions were received throughout the year on combines, seeding and fertilizing equipment, tractors, and spraying equipment.

RESEARCH PROGRAM

Field work on several research projects was completed during the year. These included tests to determine the benefits that can be obtained from combination drying of grain, and tests to determine the increase in combine efficiency that can be obtained by reducing the amount of straw passing into the combine when harvesting wheat and barley.

Work on several other projects continued throughout the year. These included tests to determine: a procedure to prevent overdrying of grain when natural air drying; the distribution system configurations that provide optimum drying performance in natural air drying bins; the cultivator shank force required for sweeps, chisel points, and deep banding knives; and the feasibility of bending stubble over before placing a windrow on it to reduce the straw fed into the combine. Several other in-house research projects were also conducted to assist in verifying and developing test procedures.

Several new projects were initiated in 1985-86. These included tests to determine the effect that spreaders and levelling of the grain in a natural air drying bin has on drying, and tests to determine the correct procedures for storing wet grain over the winter.

ACTIVITIES AT LETHBRIDGE STATION

- E.H. Wiens, Station Manager

EVALUATION PROGRAM

Several projects were completed and more initiated at Lethbridge during 1985-86. Reports were prepared on two granular chemical applicators, one sprayer, two depth controllers, six grain moisture meters, and a chemical injector system for use in sprayer plumbing systems. Fans continued to be tested with reports prepared on twenty-four ventilation fans and four aeration fans. Test work was near completion on three grain drills, one air drill and one air seeder.

New projects initiated during the year include a shrouded sprayer boom, another chemical injector system, an air seeder, a grain drill, five aeration fans, five ventilation fans, two different types of sprayer markers, a fertilizer banding knife and seed brake boots for use with air seeders.

DEVELOPMENT PROGRAM

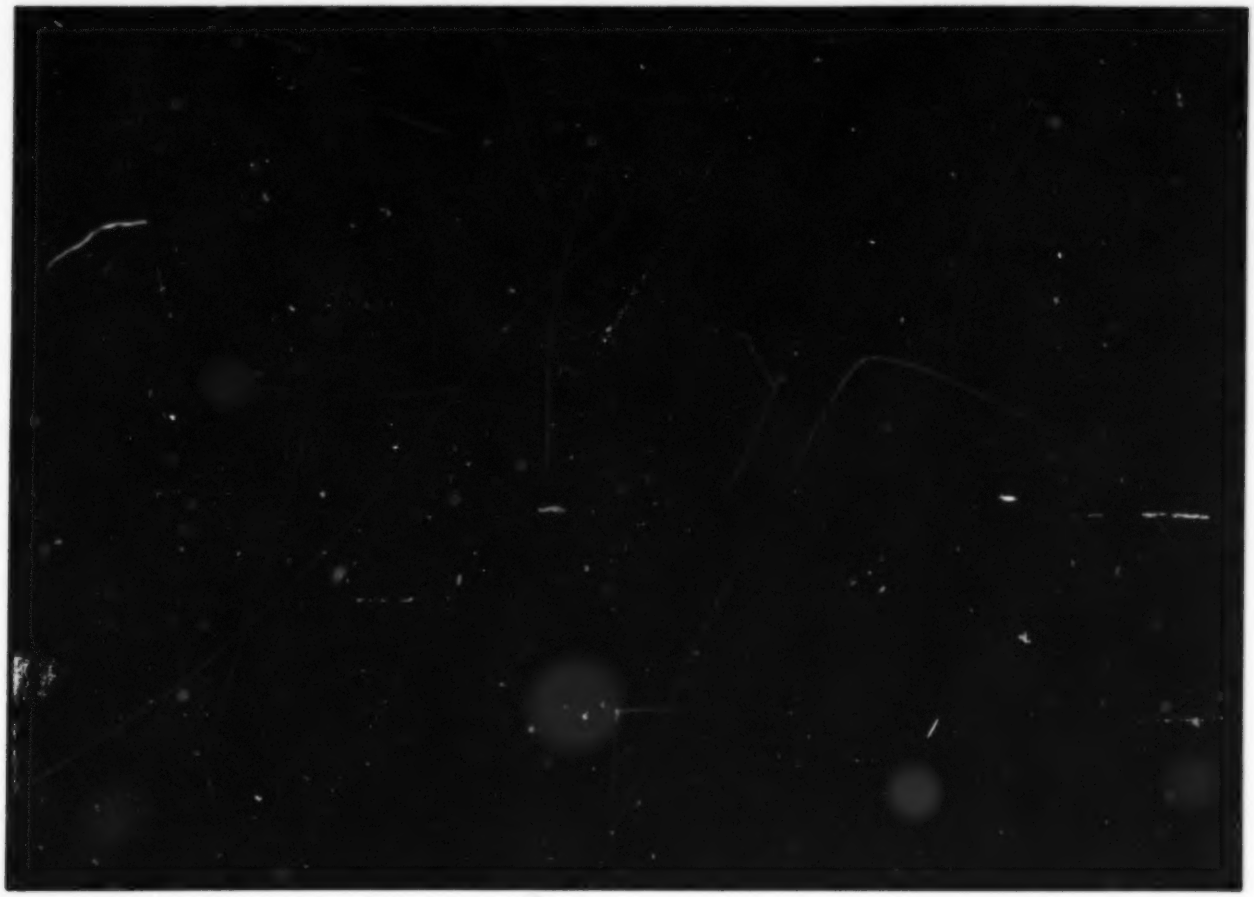
Prairie manufacturers continued to use the services of the PAMI development program through prototype testing and pre-production evaluation. The Lethbridge station was involved in projects including a bale handler, granular applicator distribution testing, two sprayer chemical injectors, and an air seeder/granular applicator. A local manufacturer also contracted to have draft comparisons made on various tillage implements. A co-operative project with Alberta Agriculture was undertaken to measure power requirements on a fertilizer injector used for precision application of liquid fertilizer into the seedbed.

EXTENSION ACTIVITIES

Lethbridge's extension staff places great emphasis on working closely with the extension division of Alberta Agriculture, to provide machinery information to farmers in each of the 66 districts of the province. The highlight during the year was "PAMI Machinery Days," organized in seven different locations across the province. Machinery Days consisted of five members of the Lethbridge staff putting on detailed day-long seminars on spraying and seeding equipment. Response was excellent, and thanks to the cooperation of Alberta Agriculture's District Agriculturists, over 680 farmers attended the meetings. In addition to Machinery Days, the extension staff did presentations at nineteen other seminars sponsored by various chemical companies, commodity groups and machinery manufacturers. A total of 2100 people participated in those presentations.

Trade Shows and conventions accounted for a large portion of extension activities this year. Twelve different shows saw PAMI displays, including Edmonton's Klondike Days, Edmonton Farm & Ranch Show, Red Deer Agri-Trade, and Lethbridge's Ag Expo., more than 250,000 people were exposed to PAMI evaluation results at these fairs.

The news media continued to be involved with PAMI staff, with 14 radio interviews, two



television shows, and five magazine feature articles being prepared. Three news releases were sent out and several dozen newspaper articles ran throughout the prairie provinces.

A total of 92 people toured the Lethbridge station, including interested parties from England, France, South Africa, Australia, Sweden and U.S.A.

RESEARCH PROGRAM

The extensive research project that began last year in cooperation with the Crop Protection Branch of Alberta Agriculture continued again this year. The question of effectiveness of weed control at reduced chemical rates is difficult to answer without extensive field plot studies under every possible condition. PAMI staff worked with Alberta Agriculture staff to apply herbicide using four different application systems at full and half chemical rates, and three different water rates. Plot work involving this research system was continued at Lethbridge.

ACTIVITIES AT THE PORTAGE LA PRAIRIE STATION

- G.M. Omichinski, Station Manager

EVALUATION PROGRAM

The Portage Station's major evaluation activities centered around the evaluation of haying equipment. Testing was initiated and completed on two round balers, two disc mower conditioners, and two round bale movers, one rake and one front-end loader attachment for bale handling.

Work also continued in the area of zero-till drills, with the distribution of two reports on earlier tested machines, and the evaluation of two additional machines.

In the area of grain handling, reports on two earlier tested grain cleaners were distributed, and evaluation of one additional machine initiated and completed. Work was also completed on one grain auger and auger safety device with reports distributed.

In total six evaluation reports were distributed, and another 10 reports were under preparation at year's end.

DEVELOPMENT PROGRAM

The development program at the Portage Station was an active one this year, with a variety of projects being undertaken. An Agriculture Canada contract (AERD) was completed on an eccentric grain cleaner, and work continued on a second AERD contract concerning the three year study on the performance of three types of zero-till drills. Under this contract functional assessment reports were distributed for two of the drills, durability was monitored, and agronomic studies were carried out by the Plant Sciences Department of the University of Manitoba.

Three projects were completed with the Field Similation Laboratory, including sprayer boom vibration analysis, an instrumentation durability test, and a swather frame stress measurement at critical points.

Other projects undertaken included preparation of an operator's manual for a PAMI designed drill marker, technical support for a whole crop harvesting experiment, draft measurements for a tillage study by the University of Manitoba, measurement of impact acceleration for a recoverable target vehicle, no-till drill support for winter wheat seeding, studies on the corrosive effects of ammonium sulphate on sprayer components, and modifications and improvements to a plot combine and plot seeder. In total $60,000 was billed for for development services throughout the year.

EXTENSION PROGRAM

Primary activities under the extension program at the Portage Station consisted of display booth activities at the Western Canada Farm Progress Show, Brandon and Winnipeg Weed Fairs, and at plot tours sponsored by a herbicide company. The extension trailer was employed for all these extension activities. Subscription sales at the weed fairs were up significantly from previous years. In addition, a display booth was set up and manned at the annual PIMA conference held in Winnipeg.

Clinics on combine operation and adjustment were hosted at three provincial centres in February, with approximately 500 attendants in total. Presentations were made by Humboldt Station staff, and were very well received. Future clinics on combines and grain drying are planned for next year.

Station tours were hosted for the Canada Grains Institute (40 foreign dignitaries), Department of Agriculture's Ag. Reps, and the Central Region's Weed Supervisors.

A gleaning on the causes of PTO vibration was prepared and distributed. An equal angle hitch display was designed and built for the Farm Progress Show. A local TV station news story on PAMI was recorded and aired during July. The Portage Station participated in the preparation of a video by Industry, Trade and Commerce, featuring agricultural equipment manufactured in Manitoba.

A slide/sound show was prepared on no-till drill evaluation work to date and was presented at the MANDAK Zero-Tillage Workshop.

RESEARCH PROGRAM

A limited research program was carried out during the year and involved one project on pastureland rejuvenation or renovation. The project undertook the evaluation of the Connor Shea Coil Tyne drill for functional and agronomic performance. This drill employs a zero-till strategy with a unique opener which effectively restricts competition by existing vegetation. Other makes of zero-till drills for pasture renovation usually require some chemical control of vegetation. The Connor Shea drill is of Australian design and not yet commercially available in North America. Agronomic studies, undertaken by the Grassland Section of the Department of Agriculture, compared performance with other zero-till drills. Significant advantages were reported for the Connor Shea drill.

AUDITOR'S REPORT

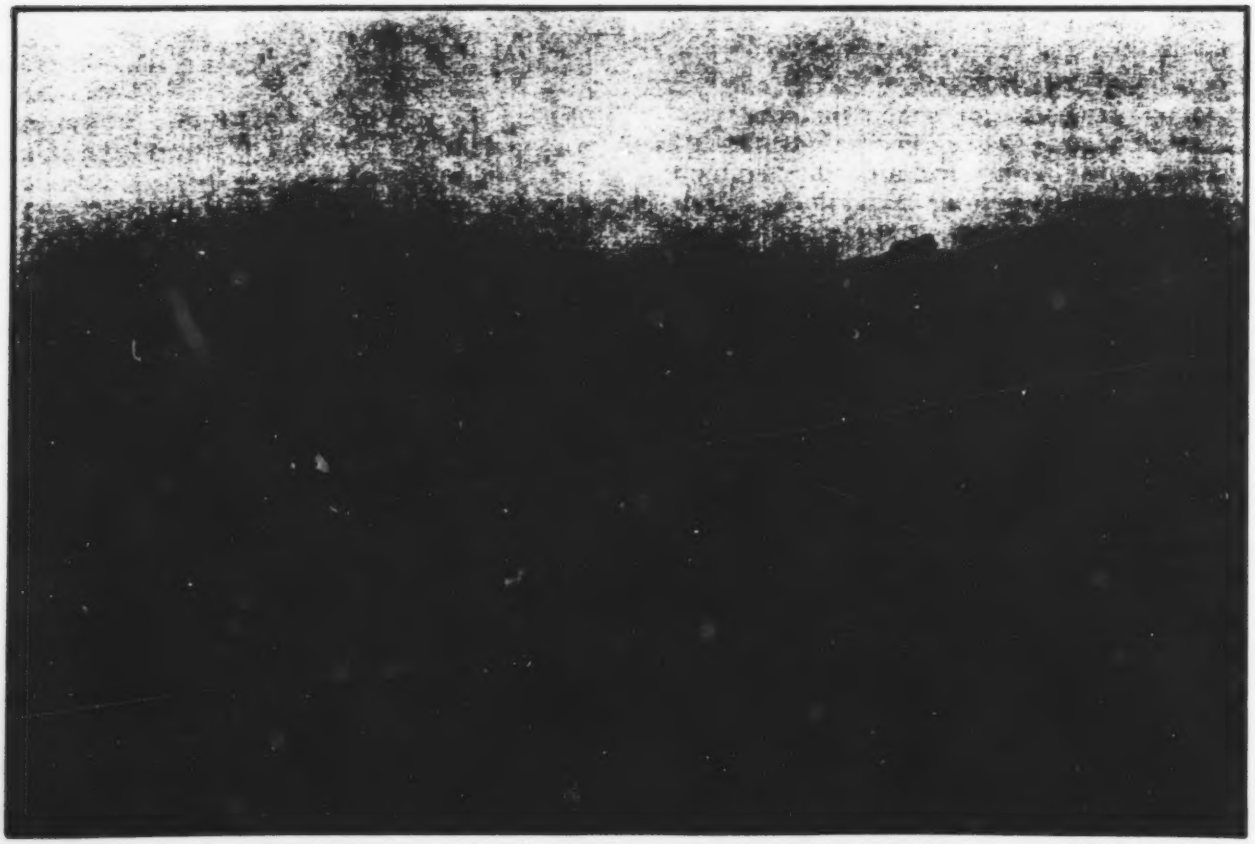
To the Members of the Legislative Assembly,
Province of Saskatchewan

I have examined the statement of financial position of the Prairie Agricultural Machinery Institute as at March 31, 1986, and the statement of revenue and expenditure and fund balance for the year then ended. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as I considered necessary in the circumstances.

In my opinion, these financial statements present fairly the financial position of the Prairie Agricultural Machinery Institute as at March 31, 1986, and the results of its operations for the year then ended in accordance with the disclosed basis of accounting applied on a basis consistent with that of the preceding year.

W.G. Lutz, F.C.A.,
Provincial Auditor

Regina, Saskatchewan
May 2, 1986



PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

Statement 1

STATEMENT OF FINANCIAL POSITION

March 31, 1986

(with comparative figures at March 31, 1985)

ASSETS	1986	1985
Current:		
Bank	$ 152,054	$ 33,124
Short term investments, at cost	646,537	796,040
Accounts receivable	124,794	165,491
Travel advances	5,250	4,520
Prepaid expenses	28,436	20,340
	957,071	1,019,515
Fixed: at cost		
Assets under capital leases (Note 4)	189,049	189,049
Buildings	2,676,608	2,672,488
Equipment - for evaluation	95,606	95,900
Equipment	1,742,394	1,703,858
Land and improvements	363,257	362,207
Furniture	292,918	290,387
Vehicles	253,358	250,147
Reference material	12,970	12,970
	5,626,160	5,577,006
	$ 6,583,231	$ 6,596,521

LIABILITIES AND FUND BALANCE	1986	1985
Current Liabilities:		
Accounts payable	$ 100,883	$ 142,524
Unearned subscription income	47,661	55,685
Project advances	12,850	--
Obligations under capital lease	41,960	35,773
	203,354	233,982
Non-Current Liabilities:		
Unearned subscription revenue	79,036	98,843
Less current portion	47,661	55,685
	31,375	43,158
Obligations under capital lease (Note 3)	87,110	122,884
Less current portion	41,960	35,773
	45,150	87,111
Fund Balance:		
Fixed assets (Note 4)	5,539,050	5,454,122
Operating (Statement 2)	764,302	778,148
	6,303,352	6,232,270
	$ 6,583,231	$ 6,596,521

(See accompanying notes to the financial statements)

STATEMENT OF REVENUE AND EXPENDITURE AND FUND BALANCE

Statement 2

Year Ended March 31, 1986
(with comparative figures for the 1985 year)

	1986	1985
Revenue: (Note 1)		
Provincial grants		
- Saskatchewan	$ 1,057,120	$ 1,101,150
- Alberta	822,205	856,450
- Manitoba	469,830	489,400
	2,349,155	2,447,000
Fee for service	231,526	316,910
Investment income	97,159	155,831
Other income	38,648	24,819
Sale of fixed assets	26,115	11,200
Subscription income	68,363	78,715
Total revenue	2,810,966	3,034,475
Expenditure (Schedule 1)	2,824,812	3,069,498
Excess of expenditure over revenue	(13,846)	(35,023)
Fund balance, beginning of year	778,148	813,171
Fund balance, end of year	$ 764,302	$ 778,148

(See accompanying notes to the financial statements)

NOTES TO FINANCIAL STATEMENTS
March, 1986

1. Significant Accounting Policies

These financial statements have been prepared in accordance with accounting policies that are considered appropriate for organizations of this type. The significant accounting policies are as follows:

Fixed Assets

The acquisitions of fixed assets are financed primarily through grants received from the Provinces of Manitoba, Saskatchewan and Alberta, and are accounted for on a fund accounting basis. In the Statement of Revenue and Expenditure and Fund Balance (Statement 2), all grants are recorded as revenue and the purchase of fixed assets are recorded as an expense. Assets acquired and accounted for as capital leases are expensed as the related principal portion of the obligations under the capital leases are reduced. Accordingly, no provision has been made for depreciation of fixed assets. To maintain accountability for fixed assets, they are recorded as a balance sheet asset with a corresponding entry to either the Fund Balance "Fixed Assets" or "Obligations Under Capital Leases". As the principal portion of the "Obligations Under Capital Leases" are reduced, the related amounts are credited to the Fund Balance "Fixed Assets".

Unearned Subscription Income

Subscription revenue for published reports is taken into an unearned subscription account as received and is amortized to income as the revenue is earned. The portion which relates to future years is shown as unearned subscription income in the Statement of Financial Position.

Fee for Service

Fee for service revenue on research contracts is recognized on the accrual basis to the extent that costs have been incurred but not billed.

Funding

In accordance with an agreement signed by the Provinces of Manitoba, Saskatchewan and Alberta, funding is received in the following proportions:

Manitoba	20 %
Saskatchewan	45 %
Alberta	35 %

The Institute, in accordance with the authority included in O.C. 1800/79, follows the policy of retaining the excess of revenue over expenditure received in the year.

2. Incorporation

The Prairie Agricultural Machinery Institute was established as a body corporate under The Prairie Agricultural Machinery Institute Act, Chapter 2, 1973-74, Revised Statutes of Saskatchewan and is continued under Chapter P-21, Revised Statutes of Saskatchewan, 1978.

The purposes of the Institute include:

a) to test and appraise under actual or simulated working conditions, machinery sold or offered or intended for sale;
b) to undertake development work to improve and develop machinery for agricultural use;
c) to publish such reports, pamphlets and bulletins as are consistent with the intent of the Act.

3. Obligations Under Capital Leases

The following is a schedule of the minimum lease payments for several capital leases having implicit interest rates ranging from 13.5% to 16.6% which expire in 1988, together with the present balance of the total obligations under the capital leases:

March 31, 1987	$ 52,846
March 31, 1988	45,651
March 31, 1989	3,240
	101,737
Less: amount representing interest	14,627
	$ 87,110

4. Fund Balance, Fixed Assets

	1986	1985
Fixed assets, March 31,	$ 5,626,160	$ 5,577,006
Less obligations under capital leases	87,110	122,884
Fund balance, fixed assets	$ 5,539,050	$ 5,454,122

5. Government Assistance

During the 1986 fiscal year, the institute received government asistance related to employment of students in the following amounts:

Government of Canada	$ 15,415
Province of Manitoba	4,087
Province of Saskatchewan	1,200
	$ 20,702

These amounts are included in other income in the statement of revenue and expenditure and fund balance.

SCHEDULE OF EXPENDITURE

Schedule 1

Year Ended March 31, 1986
(with comparative figures for the 1985 year)

	Administration	Testing Equipment	Capital	1986 Total	1985 Total
Advertising and promotion	$ 7,390	$ 14,783	$ --	$ 22,173	$ 30,535
Bad debts	57	--	--	57	24,544
Building	--	--	4,120	4,120	13,111
Computer services	17,745	7,537	--	25,282	22,236
Contractual services	--	18,916	--	18,916	117,782
Employee benefits	16,616	156,083	--	172,699	165,233
Equipment - machinery to be evaluated	--	--	32,349	32,349	11,585
Equipment	--	--	81,425	81,425	125,093
Furniture and fixtures	--	--	2,531	2,531	9,729
Honoraria	3,375	--	--	3,375	7,015
Insurance, licenses and taxes	121	98,849	--	98,970	90,275
Interest expense - leases	--	17,067	--	17,067	22,337
Land improvements	--	--	1,050	1,050	750
Printing and binding	16,544	81,829	--	98,373	160,644
Professional and technical services	13,026	--	--	13,026	11,699
Reference material	4,975	6,140	--	11,115	9,788
Rent - building and equipment	--	82,175	--	82,175	43,424
- equipment to be evaluated	--	10,682	--	10,682	7,262
Repairs and maintenance - building and equipment	1,632	55,274	--	56,906	57,580
Salaries	153,004	1,490,857	--	1,643,861	1,637,044
Shop supplies	--	85,256	--	85,256	119,047
Stationery and office supplies	32,898	47,733	--	80,631	102,037
Telephone and telegraph	11,419	41,042	--	52,461	59,968
Travel and vehicle operations	22,714	110,778	--	133,492	131,131
Utilities	--	64,683	--	64,683	58,549
Vehicles	--	--	12,137	12,137	31,100
	$ 301,516	$ 2,389,684	$ 133,612	$2,824,812	$3,069,498